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ORIGINAL ARTICLES

INFARCTION.*

W. A. STANLEY, M. D.,
Lakeland, Fla.

Dorland says that "an infarct is a mass of substance extravasated either into the substance of an organ or into a vessel, due to the obstruction of the circulation."

The extent of the local anæmia depends upon the amount of tissue involved, and it is readily understood that the organs which are more delicately constructed are more liable to an early involvement, as in the nerve cell, which if subjected to an anæmia for a few moments only, loses its ability to functionate and is subjected to nonmolecular death.

In the less highly organized tissues and those with a greater decreasing susceptibility, as we find in the connective tissue, there is a possibility of transplanting from one animal to another without the death of the tissue.

More complete anæmia may be caused by the inability of the blood to reach the tissue. There are other conditions of the tissues which may resemble infarction, such as the clotting of blood, which caused the death of ex-President Roosevelt, who died from the effects of pulmonary embolism or the clotting of blood in the lung from a broken pulmonary vessel, or the severe injury of the cells, and the setting free of some sort of ferment responsible for the coagulation of the blood, and in which condition there is a clotting of the intercellular as well as the intracellular fluids and where the dead cells are held in coagula entanglements described by one author as coagulative necrosis.

The traditional pyramidal form is not always present, although it may often be found and can be accounted for by the arborvitæ or fan-shaped arrangement of the vessels. The cortex of the kidney will present a cuboid form, as you know, due to the vessels springing out at almost right angles from the main trunk of the vessel. It may be longitudinal, as in a section of a gut.

The area of infarction, at first, is of a firm œdematous appearance, and a little later, as in the brain, is called "areas of softening." The liquefaction of the myeline substance overcomes the firmness caused by the fibrin.

There are two kinds of infarcts, at least, the red or hæmorrhagic, due to red blood cells being injected into the more loosely constructed tissue, and the white or pale infarction, due to anæmia.

The arrangement of the tissue stamps the color of the infarction. For instance, in the kidney we scarcely ever have the red type; while in the lung tissue you will find or be met with the absence of the anæmic type; but in the heart, liver and spleen we find both types.

Kidney infarctions may be found to extend both ways from the plug, as well as down towards the pyramids, and are usually found in the cortex.

In the case of "stab wounds severing the renal artery, an infarction involving a large part of the cortex may be present."

We find the same condition in the spleen, except that the area of infection may even be larger. A layer of fibrin which roughens the surface may be felt by deep palpation.

In case of arteriosclerosis of the coronary arteries, especially if vegetation growths have been swept in from the auricula ventricular valve, the nutrition of the heart muscle is so limited that the muscle dies, resulting in cardiac rupture.

*Read before the Tri-County Medical Society, at Arcadia, January 14, 1919.

Owing to the abundance of blood supply to the liver, infarction of that organ is extremely rare. Experimental cases in which the whole of the blood supply from the portal vein has been turned into the vena cava show that while there is a diminishing in the size of the liver, yet there is no infarction; however, closure of branches of the portal vein may result in infarction, especially if there is some enfeeblement of the general circulation.

On account of the double vascular supply in the lung, the bronchial arteries really furnish nutriment to the branches only and the immediate adjacent lung tissue. It is therefore not to be wondered at, "if we tie a branch of the pulmonary artery which has no connection with other branches, as for instance in the isolated lobule in the dog's lung, you will find all the tissues die, except the bronchial wall, due to the extreme wide capillaries."

The pulmonary arteries anastamose with extraordinary freedom and on this account it seems impossible to produce an infarct in the lung of a healthy animal by throwing emboli into the pulmonary stream, because the obstructed area is at once nourished by collateral circulation. It is said that Virchow did succeed in producing such an infarct, but the emboli carried bacteria, which carry a far greater injury to the tissues than could have been done by a sterile plug. It is only when there is a malnutrition of the pulmonary tissue, as by high blood pressure, or any circumstance which will cause slowing of the circulation, that you will get an infarct in the pulmonary vein, such as a chronic passive congestion which results from "obstruction of the mitral valve backward into the lung." The spitting of blood and sudden pain, with the change to the dull note on percussion, will suggest the possible formation of an infarct.

The lung infarct is a solid hard mass, often a number of them and reaching to the lung surface. You will find the pleura over them roughened by a layer of fibrin, which destroys its gloss, and is responsible for the pain, because of the contact with the opposite pleural wall during the act of inspiration and expiration.

These infarcts vary in size from 1 cm. to the involvement of almost the entire lobe of the lung. These have a tendency to the pyramidal form, but bulge out a little on the surface of the lung, and range from dark red to almost black in color. Upon cutting into them, you will find that the same color extends almost through the tumor, and you will find the emboli lying at the apex of the triangle which covered the condition. This is not, however, always true, as one author has said, that "you will sometimes see an empty stretch of vessel," but it seems that the weight of the evidence is in favor of the emboli as the cause of the infarct.

There is some evidence of hyaline emboli in the smaller branches of the pulmonary artery. The pyramidal appearance of the tissue will differentiate it from the hæmorrhagic, which are usually soft and œdematous loose and irregular in outline and occupying any part of the lung without regards to any special arrangement, as the following of the line of a blood vessel. The rapid absorption of blood from such tumors, probably, keeps them soft, while in an infarct the mass is overfilled with blood which has no way of escape.

When a real infarct of the lung takes place there is very little hope of resolution or absorption.

The formation of infarcts in the brain are very common, especially in cases in which there has been thrombi formed in the left side of the heart in such a way as to be thrown into the cerebral circulation. As you know, the symptoms vary according to the location of the emboli; sometimes resembling paralysis. Infarctions of the intestines are commonly caused by strangulated hernias, or a twist. Similar effects can be produced by fibrous bands being drawn tight over vessels in the messentary; a very common cause is intussusception.

Infected plugs will give rise to an inflammatory process which may liquefy with the leucocytes hurrying to the spot for the battle

of leucocytosis. The softening seldom results in a scar as in other cases of infarction. Healing of the infarctions of the kidney and spleen is not uncommon, and leaves a grayish yellow speck.

CARROLL-DAKIN SOLUTION.

DEAN T. SMITH, M. D.,
Daytona, Fla.

I have had a little experience with the Carroll-Dakin solution. The preparation I have used is chlorazene.

My first case had diabetic gangrene. An abscess had formed about the middle of back, lower dorsal region. When I first saw her, the skin over the ulcerated portion was black and dry. Beneath was a quantity of pus and sloughing subcutaneous tissue. The skin, except the rim, which was still adherent to the healthy cuticle, was cut away. The space beneath was cleaned and some cotton saturated with a one-per-cent solution of chlorazene packed into the ulcer. There was nothing magical in the action of the solution, but it was very satisfactory. In a few days suppuration had ceased and the gangrenous tissue had separated, leaving a clean, healing ulcer. We continued the use of the solution. What was an ulcer of two and a half to three inches in diameter, is now about an inch and is healing satisfactorily.

A second case was compound fracture of the right ulna. The radius was also broken. I first saw the case with Dr. Merryday. A kicking Ford was responsible for the injury. The victim, a fruit vender, said the bone stuck out about an inch. When he saw it, he pulled on his hand and the bone went back into place. The skin wound was about an inch long. We used chlorazene in the wound at time we set the fracture, but in two or three days suppuration was established. I finally put on a dorsal splint, leaving the wound so it could be exposed. Chlorazene, one-per-cent solution, was injected into the wound four times a day. This was done by pushing a medicine dropper to the bottom of wound. The pus rapidly disappeared, giving place to a watery secretion and rapid and satisfactory healing, both of the flesh wound and the bone. If I have another such case, I will inject the chlorazene frequently from the very beginning of the treatment.

It has been claimed that a germicide strong enough to kill the germs in an infected area, would injure the delicate granulations. The Dakin solution seems to be an exception. The little experience I have had with it confirms the published reports that, while it acts as a germicide to pus germs, it does not interfere with healing, but seems to stimulate healthy granulations.

LETHARGIC ENCEPHALITIS — REPORT OF CASE WITH SYMPTOMS OF.

R. R. SULLIVAN, M. D.,
Lakeland, Fla.

Having been puzzled over an unusual train of symptoms, I read with unusual interest an editorial in the *Journal of the American Medical Association* on this subject. The symptoms reported very strikingly resembled those of my case; so much so that I have been prompted to make the following report:

Male, age twenty-six, just arriving from his home in a Northern State, came to my office complaining of dizziness, nervousness and diplopia. Had normal temperature. Next day, February 11, 1919, his condition was unchanged, complained of having been wakeful during the night. On February 12th was confined to bed with intense headache, temperature 101, drowsiness, retention of urine. On February 13th temperature was 103, with other symptoms unchanged. Complete examination made at this time revealed the following: Kidneys, normal; Widal, negative; malaria, negative; Wasserman, negative; eye ground, normal; ears, normal; reflexes, normal. Differential blood count was as follows: Polymorph, 68 per cent; lymphocyte, large, 4 per cent, small, 17 per cent; transitional, 5 per cent; mast, 1 per cent; eosinophiles, 5 per cent.

Retention continued and became complete, without desire to urinate. Drowsiness deepened to a complete stupor. Patient would sleep quietly for hours, easily roused to answer questions and to take nourishment. On February 16th, six days after onset, patient complained of intense pain over right mastoid. On same day right facial paralysis was noted. This became complete by February 18th. After February 13th temperature gradually diminished to become normal on the 18th; stupor gradually lessened; voided urine on February 20th; dismissed from hospital on 23d. Paralysis of facial nerve gradually lessened, but examination three weeks after leaving hospital shows some involvement of this nerve. Otherwise patient has fully recovered.

MESSAGE AND SUMMONS TO RED CROSS MEMBERS.

To the Members of the American Red Cross:

Speaking as the new chairman of the Central Committee of the American Red Cross, to which the War Council has now returned the responsibility of direction, I wish my first message to be one of congratulation, but to be, at the same time, a summons.

The accomplishments of the last two years have been vast and inspiring. Wherever the call has been heard, the Red Cross was ready. While the more dramatic undertakings may have been upon the European fronts, it must always be remembered that those splendid and achieving groups of workers on the other side would have been helpless without the spirit, will and effort of the millions of men and women who make up the Red Cross in America.

Accepting its commission from the American people, the Red Cross built up a war program of service not only to our own soldiers and sailors and their families, but to the war-stricken peoples of our allies, particularly where the distress of the refugees and helpless children made an appeal which could not be disregarded. This war program is not ended with the armistice. Our army is still in Europe, and while France, Italy and Belgium are rapidly assuming the responsibilities within their own borders, our work there can not be ended suddenly. And now the calls from Poland, the Balkans, Russia and Palestine have forced the sending of new commissions to those countries to bring, in the name of the American people, that emergency relief in sickness and suffering which only the Red Cross is organized to carry.

It was expected last November that the effort already made and the funds in hand would be sufficient completely to meet the obligations which the Red Cross had been forced to undertake. It is now apparent that this is not the case. In spite of the strictest oversight of commitments and the most rigid economy, the appropriations by the War Council for relief in Europe for the months of January and February have been the largest in the history of the organization. In other words, the war task of the Red Cross is not yet finished and our divisions and chapters must hold themselves ordered and ready for instant service. A further appeal for funds will be postponed until the last possible moment.

While the chief energies of the Red Cross must still, for a short time, be devoted to the program of war, the program of peace, broader and more fundamentally important, is opening before our eyes. In reality it is already taking shape, and the activities of the great organization in public health, in nursing, in home service, in junior membership, etc., are pointing the way to the new field which the new Red Cross shall fill.

In the meantime, the immediate obligation is clear: to carry through to an effective end, at home and abroad, the war program undertaken in the name of the American people. There remains the inspiring future, where the new spirit of service, born of the war and symbolized by the American Red Cross, shall be turned to the prevention of disease, the relief of suffering and the improvement of the conditions under which we live.

LIVINGSTON FARRAND,
Chairman of the Central Committee.

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(To be selected).

Next Meeting—Miami—May 21, 22, 23, 1919

THE MIAMI MEETING.

The Florida Medical Association will hold its forty-sixth annual meeting at Miami on May 20th, 21st and 22d. Members of the Association are daily being released from military service and in the majority of instances returning to their former locations. Everything points to a large attendance and a most interesting meeting. Dr. H. C. Babcock, Chairman of the Committee on Arrangements, is working enthusiastically for a successful meeting and the fact that he has the membership of the Dade County Medical Society behind him augments well. Dr. Wm. E. Ross, Chairman of the Committee on Scientific Work, reports that a full and an interesting program will be presented to those in attendance. There is no more delightful a spot in the State of Florida than Miami, and all members should grasp the opportunity of a well-earned relaxation after the strenuous days of the past year. A feature of the meeting this year will be the organization of the Florida Association of Railway Surgeons. The Florida East Coast Local Surgeons will also form an organization. Our next issue will have more to say of the attractions of Miami and of the general arrangements of the meeting.

AWAY WITH THE SCISSORS.

During the past year THE JOURNAL has suffered very materially as a result of so many of the scientific contributors being in the military and naval services of the country. In addition to this those remaining in civil life had so many demands on their time that they have been unable to prepare articles for publication that they otherwise would have. Scientific medicine laid low and went in to help win the war. The war is over, it has been won, and medicine has done its full share. During the interim THE JOURNAL has been compelled to use the scissors frequently—too often—to secure material with which to fill up the reading pages. No one criticized—we weathered the storm. Thanks are due our advertisers who remained loyal

to us all through these demoralizing times. Prior to the war THE JOURNAL of the Florida Medical Association stood in the front ranks of the State-owned journals. During the past year the publication has not been up to the standard; we have, however, the very best sort of an excuse. This we are now without, and it is hoped that no excuse from henceforth will be necessary. It is imperative, however, that County Secretaries urge their members to prepare papers and present them before their organizations. Too often very valuable material is lost to THE JOURNAL by failing to forward papers read before county societies for publication. With very little individual effort this can be overcome and great benefit result to the individual, the county society, the profession of the State and THE JOURNAL. We, therefore, urge all to assist in doing away with the scissors.

THE SCIENTIFIC ASSEMBLY OF THE AMERICAN MEDICAL ASSOCIATION.

The criticism has been made that the annual sessions of the Scientific Assembly of the American Medical Association are entirely too strenuous; too many section meetings go on at the same time, and practically every minute is occupied by scientific work, even the evenings often being given over to scientific work rather than social functions. The number of papers on the programs of all the sections have run as high as 350 or 400. There is no other scientific or medical convention, state, national or international, at which so many papers are read or so much scientific material is considered. In this country there is only one other convention that is similar in character—the Congress of Physicians and Surgeons of North America—which has met every three years at Washington. This is composed of some ten or twelve special societies which might be compared with the sections of our Scientific Assembly. These special societies meet only in the morning, as there is a general meeting in the afternoon which the members of the special societies are supposed to attend. Actually the afternoon and evening sessions are more social than scientific. The British Medical Association is more comparable with our association. Those who have attended the annual sessions of the British Medical Association have quickly noticed a difference—its scientific work is confined to the morning hours, while the afternoons and evenings are given over to social matters, garden parties, conversazioni, tea, cricket and what not. Our British confreres seem to devote a large portion of the time at their annual meetings to having a good time and to forming new and renewing old acquaintances.

While the British Medical Association's scientific program provides for many sections, most of them hold but one or two meetings during an annual session and usually have a very short program, frequently only two or three papers. With an increasing number of sections, our annual sessions have become more and more strenuous; for those who are attached to any particular section, attendance on these meetings becomes a drudgery—hard work without relaxation. There should be a happy medium. Primarily the sections of the Scientific Assembly are for the dissemination of scientific knowledge among the Fellows; almost, if not quite, as important an object of these annual meetings should be the social aspect, the getting acquainted with other physicians, not only with those interested in a similar kind of work, but also with physician and medical interests in other fields.

Our Scientific Assembly is a combination of fifteen, sometimes sixteen, sections. In the past, these sections have all met at the same time, both morning and afternoon, during the three days devoted to section work; and this, notwithstanding the fact that a large majority of the Fellows who attend these annual sessions are not especially interested in the work of any one section. Most of them are attracted by the programs of several or all of the sections. Many Fellows are confused by the multiplicity of good things

placed at their disposal. Frequently they become bewildered by this complexity of the program and fail to take advantage of any of the scientific work.

These faulty conditions have been recognized for some time. They constituted the first problem taken up by the Council on Scientific Assembly. In 1917, the Council proposed a plan for abating the evil. This provided for three meetings for a majority of the sections, but allowed certain others to hold five or six. The plan was adopted, but later in the session a protest was made, presumably because the scheme favored certain sections to the disparagement of others, and the House of Delegates reconsidered its action. Last year, the House directed the Council on Scientific Assembly to study this problem and to formulate a definite plan of procedure for future meetings. In compliance with these instructions a tentative program was worked out by the Council and was presented to a meeting of the secretaries of the sections held in Chicago, February 6. This scheme was the same as that adopted in 1917, except that all sections were treated alike. The secretaries discussed the subject thoroughly and were enthusiastic in favoring its adoption. It was agreed, further, that the proposal should be put into effect this year at Atlantic City.

Each section at the coming Scientific Assembly will be limited to one meeting each day, half to hold morning sessions and the other half afternoon sessions. Special attention was given to the grouping, so that sections devoted to allied subjects will alternate. For example, the ophthalmologist may attend his own section in the morning and that on laryngology in the afternoon; the internist may attend the Section on Practice of Medicine one half day, and the other half day the Section on Surgery, Pathology or Pharmacology. Loyalty to a particular section has been and is an important factor in developing the Scientific Assembly of the Association. However, the new arrangement will encourage rather than discourage full attendance on the sections in which a Fellow may be particularly interested. He will now be able to attend other sections without his conscience being disturbed by feeling that he is neglecting that section to which he should give his entire allegiance.

The new arrangement simplifies the programs, equalizes attendance on the sections, broadens the scope of the discussions, and, finally, affords opportunity for social gatherings.—*Jour. A. M. A.*

EPIDEMIC OR LETHARGIC ENCEPHALITIS.*

Acute Infectious Ophthalmoplegia, Acute Encephalitis, Nona?

This unfamiliar disease, many cases of which were observed in England and France early in 1918 and in Vienna in the winter of 1916-1917, when von Economo suggested the name "encephalitis lethargica," now seems to be making its appearance in various parts of this country. In the recent discussion on influenza before the Institute of Medicine of Chicago, Bassoe[1] stated that during the last few weeks he had seen several cases which were characterized by marked drowsiness and paralysis of cranial nerves, especially the ocular, and which otherwise corresponded to the clinical picture of lethargic encephalitis, and that he knew of similar observations by other physicians. Last week Pothier[2] reported the clinical details of eight cases from Camp Lee, Va., and Neal[3] mentions the occurrence of cases in New York.

In previous editorial discussions[4] of the European, especially the English, reports on lethargic encephalitis, special emphasis was placed on its similarity to the cerebral and bulbar forms of epidemic poliomyelitis, and it was suggested that further investigations might show "the new disease" to be true epidemic poliomyelitis. In the meantime, the report[5] of an extensive collective investigation of lethargic encephalitis (168 cases) has appeared from which we learn that, while

*We publish on another page in this issue a Report of Case of Lethargic Encephalitis, by Dr. R. R. Sullivan of Lakeland.—Ed.

nothing by way of a causal agent has been demonstrated, intracerebral inoculations of monkeys with emulsions of diseased nervous tissue failed completely to produce any results. As the monkey is readily susceptible to such treatment with similar material from cases of epidemic poliomyelitis, the present indications are that the two diseases are separate and distinct, and this conclusion is borne out also by certain clinical and epidemiologic differences to which attention has been called, by Netter in Paris, especially. It is noteworthy, however, that the anatomic changes in the two diseases are of the same general nature, and MacNalty[6] ventures the suggestion that the relation between epidemic poliomyelitis and lethargic encephalitis may be comparable to that between typhoid and paratyphoid fevers. The English investigators consequently regard lethargic encephalitis as due to an as yet unknown virus which causes inflammatory changes, especially perivascular infiltrations, in the basal ganglions, the upper part of the pons, especially in the gray matter of the floor of the fourth ventricle, and in less degree elsewhere in the medulla. It is distinctly a poliencephalitic disease: the outstanding clinical features are a more or less pronounced lethargy, often progressive and paralysis of the third and less often other cranial nerves.[6] Ophthalmoplegia was observed in about 75 per cent of the English cases.

It is noteworthy that cases appear to occur with the general symptoms of fever, lethargy and weakness, but without paralysis, and hence are easily mistaken for more common infections, though perhaps of the greatest importance in the spread of the disease, which now is notifiable in England and Wales. At present, however, no new cases seem to be occurring in these countries. The results of further and more complete observations of lethargic encephalitis as it occurs in this country will be awaited with special interest.

It is quite remarkable that while English and other European observers do not seem to place any special stress on the relation of the newly recognized disease to influenza, the American cases so far reported are associated by the observers, particularly Bassoe[1] and Neal,[3] more or less directly with influenza. Four of Pothier's[2] eight patients are said to have had influenza a few weeks before they came down with lethargic encephalitis. While the question thus raised can not be answered at this time, the information we now have indicates that it is only in connection with epidemics of influenza that anything definitely resembling lethargic encephalitis is described in the older literature.

It is said that profound and prolonged sleep has been observed in connection with many epidemics of influenza since early times. Zuelzer[7] mentions that in the epidemic of 1712, somnolent conditions were so frequent and so marked that in Tübingen, for instance, the disease was known as sleeping sickness, and Longuet[8] gives a quotation from Camerarius which appears actually to describe ophthalmoplegia. Coming down to more recent times, we find that in the early nineties of the last century, at the time of the influenza outbreak of 1889-1891, quite a little was written about a since forgotten disease called "nona" (also "la nonna"), which is said to have occurred especially in northern Italy and Hungary, but also elsewhere, and of which lethargy and weakness were pronounced manifestations.[9] At about the same time cases of ophthalmoplegia with stupor and somnolence were described by Blanc, Mauthner and others,[10] and the question was raised then whether "nona" was not a kind of ophthalmoplegia. "Nona," however, failed to establish itself as a definite disease, and was soon forgotten completely.[11] —*Jour. A. M. A.*

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1. Bassoe, Peter: J. A. M. A. 72: 677 (March 1) 1919.
2. Pothier, O. L.: Lethargic Encephalitis, J. A. M. A. 72: 715 (March 8) 1919.
3. Neal, Josephine B.: Meningeal Conditions Noted During the Epidemic of Influenza, J. A. M. A. 72: 714 (March 8) 1919.
4. Is Epidemic Poliomyelitis Prevalent in England and France? editorial, J. A. M. A. 71: 1221 (Oct. 12) 1918; Encephalitis Lethargica: A New Disease? ibid. 72: 414 (Feb. 8) 1919.

5. Report on an Inquiry into an Obscure Disease, Encephalitis Lethargica, L. G. B. Rep. N. S. 121; reviewed in Brit. M. J. 1: 45 (Jan. 11) 1918.

6. For more complete description of symptoms see p. 794, this issue.

7. Zuelzer: Influenza, Ziemssen's Handbuch der speziellen Pathologie und Therapie 2: 506, Part 2, 1874.

8. Longuet, P.: La nona Semaine med. 12:275, 1892.

9. For reference to the literature on nona, which is well abstracted by Longuet, see Index Catalogue, Library of Surgeon-General's Office, Series 2, 7: 945, 1902 (Anomalous and Unusual Forms of Influenza).

10. Cited by Longuet (Footnote 8).

11. The derivation and meaning of the word "nona" are obscure. It may have been a corruption of coma. Nona means literally ninth hour, and there is no evident connection between this meaning and the disease in question. "La nonna," a name also given the disease sometimes, means grandmother literally, and here again the connection is not evident. Nona is defined as follows in Foster's Encyclopediac Medical Dictionary (1894): "An alleged new form of disease reported in 1890 from northern Italy, Bavaria and Russia. It appears, however, that there is no foundation for the supposition that there is any such new disease, and that the reports are founded on cases of comatose typhoid fever, somnolence following influenza, and smallpox of an irregular and severe development."

THE DANGER OF INHALED DUST.

In a widely circulated popular book, entitled "Dust and Its Dangers," which was published about thirty years ago, emphasis was placed on the distribution of bacteria by that form of "matter out of place" which is commonly designated as dust. This was quite appropriate at a time when the widespread distribution and previously unsuspected significance of the micro-organisms were being brought to the notice of the world at large. Since that early period in the development of modern bacteriology, preventive medicine has begun to direct attention to quite different aspects of the dust menace. The recognition of the possible pathologic effect produced by the inhalation of minute, nonliving particles of matter is by no means new. Clinical observations on the subject have long been on record; and the question as to whether certain pigmentations of the lung are due to extraneous particles or to pigmented tissue products has been debated since the days of Virchow. Nevertheless it has been due to the demands of industrial hygiene, perhaps more than any other stimulus, that careful investigation has been renewed in this field of inquiry.

It is known from industrial experience that there are distinctions between dusts of different origins, so far as their effects after inhalation are concerned. Dust rich in silica, such as is encountered in the gold mines of the Transvaal and in many potteries, is admittedly dangerous. On the other hand, in comparison with flint dust, it is believed that coal dust and shale dust are relatively harmless. An investigation conducted by Mavrogordato for the English Medical Research Committee under the national insurance act has thrown some light on the distinctions just referred to. Specifically formulated, the question may be thus presented: Since it may be regarded as established that all forms of dust enter the lungs, why is it that some, such as coal, are relatively harmless, while others, such as flint, are deadly?

The answer appears to lie in the fact that some dusts are eliminated much more readily than others: at any rate, when the exposure is a moderate one. After intense dusting, all the dusts appear to produce much the same effects, both immediate and remote. But under the more usual industrial conditions, it seems, from Mavrogordato's investigations, that dusts which make mischief are dusts that accumulate. Coal and shale, for example, are taken up by cells which are quickly shed and consequently do not set up processes which block lymphatics. These cells frequently break down, and masses of dust are to be seen on the surface of the alveolar walls. Plugs of mucus, dust cells and dust find their way out of the lungs through the bronchi, though some dust may leave indirectly by means of the lymphatics. In other words, the more readily eliminated dusts produce a marked initial reaction with much shedding of epithelium. The flint dust and crystalline silica, by way of contrast, are taken up by cells that tend to remain in situ. They form plaques which persist, and the shedding of the epithelium is far less conspicuous. Cell proliferation is much more marked, and fibrosis may ensue. Permanent lesions are liable to be produced.

Since many persons are engaged in es-

sential employments that compel them to pass a large portion of their time in dusty atmospheres, the question of ameliorating the conditions and averting the dangers is a serious one. Even if dust rarely kills, aside from producing considerable fibrosis of the lung it may predispose the individual to pulmonary tuberculosis. Dilution of the dust seems, by itself, to offer little promise of help in the case of the more dangerous sorts; for the dose must be extremely small in the case of such particles as flue dust and silica, if accumulation is to be avoided in the lung. There is somewhat greater prospect of relief in the observation that dusts which produce an initial reaction of epithelium shedding tend to carry the more inert forms out with them. Thus some admixture of coal dust may act as a protector when the more deadly dusts are inhaled; in fact, such chance combinations may explain the apparent immunity experienced by certain workers with flint and silica dusts. Coal dust has its special industrial risks, since it is responsible for explosions in the coal mines. This danger can be reduced to a minimum by mixing coal with inert dusts. Hence Mavrogordato remarks that the ideal would be to stop colliery explosions by adding flint and to stop phthisis by adding coal, thus holding a tenace over providence.—*Jour. A. M. A.*

TAKING CHANCES IN BLOOD TRANSFUSION.

Transfusion of blood or blood constituents has become a necessity in modern clinical practice. Its general utility is unfortunately still limited by a number of difficulties of technic and incompatibilities of blood that have not been satisfactorily mastered. None of our present methods—the syringe cannula, the paraffined tube and the citrated blood procedures—are absolutely free from all objectionable features, among which unanticipated hemolysis, agglutination of the corpuscles, and febrile reactions are included. Of the dangers due to incompatibility we shall consider particularly those due to agglutination rather than those due to lysis.

In 1900, Landsteiner first suggested that human beings might be divided into definite groups according to whether or not the corpuscles of one were agglutinated by the serum of the other, or vice versa. His preliminary grouping into three classes was subsequently shown to be somewhat inaccurate, and numerous examinations made since that time have definitely shown that there are four groups. As long ago as 1907, Hektoen[1] said: "From the practical point of view, isoagglutination of human corpuscles is of immediate interest in connection with the determination of the opsonic index and with transfusion of blood." It will be remembered that in 1906 Crile had successfully transfused blood from normal to diseased human beings. Hektoen also said, in commenting on this achievement: "The occurrence of isoagglutinins in human blood suggests that under special conditions homologous transfusion might prove dangerous by leading to erythrocytic agglutination within the vessels of the subject transfused." Since 1906, transfusion has been performed on such a multitude of persons in such a great variety of disease conditions that there is good evidence to show the necessity for again repeating the warning of Hektoen to the effect that the presence of these isoagglutinins in human blood may be a danger during transfusion. Cases of transfusion in human beings with seemingly unfavorable results due to cross-agglutination were reported by Schultz (1910), Hopkins (1910) and Ottenberg (1911).

The subject has been somewhat complicated by the introduction of the citrate method of transfusion, whereby the agglutination of the blood during transfusion is prevented by the addition of a small quantity of sodium citrate. This method of transfusion, being relatively easy, has become quite a vogue, and has led many observers to believe that preliminary tests of the compatibility of donors' and recipients' blood are unnecessary. This appears to have been the

case especially with some of those who utilized the transfusion of convalescents' blood as a means of treatment during the recent epidemic of respiratory diseases. Recently Pemberton has reported on 1,036 blood transfusions, and he further emphasizes the need of preliminary tests.[2] This large series of transfusions was made in the Mayo Clinic between 1915 and 1918, thirty-five of them by direct methods and 1,001 by the citrate method. Pemberton is convinced of the importance of preliminary tests before transfusion. He points out that Bernheim in 1915 collected data of 800 transfusions by twelve different operators, and reported hemolysis in fifteen cases with four deaths. In twelve cases in the series of transfusions in the Mayo Clinic there were group reactions. In every case in which the blood had been grouped by the microscopic test, the observers were able to locate later the error in the test, most of them due to clerical errors in recording the group of the donor or the recipient. He describes a typical reaction, such as occurs when transfusion is done between persons of incompatible groups:

"They occur early after the introduction of 50 or 100 c.c. of blood; the patient first complaining of tingling pains shooting over the body, a fulness in the head and an oppressive feeling about the precordium, and, later, an excruciating pain localized in the lumbar region. Slowly but perceptibly the face becomes suffused, a dark red to a cyanotic hue; respirations become somewhat labored, and the pulse rate, at first slow, sometimes suddenly drops as many as 20 to 30 beats a minute. The patient may lose consciousness for a few minutes. In one half of our cases an urticarial eruption, generalized over the body, or limited to the face, appeared along with these symptoms. Later the pulse may become very rapid and thready; the skin becomes cold and clammy, and the patient's condition is indeed grave. In from fifteen minutes to an hour, a chill occurs, followed by high fever, a temperature of 103 to 105 degrees, in which the patient may become delirious. Jaundice may appear later. The macroscopic appearance of hemoglobinuria is almost constant. In three such instances the symptoms were not recognized at the time of transfusion, and 500 c.c. of blood were injected. All the patients died, two in one and three hours, respectively, following the transfusion, and one became comatose shortly afterward and died thirty hours later. In the other nine instances the symptoms were early recognized and interpreted, and the transfusion was concluded after the injection of 50 to 100 c.c. of blood. Adrenalin (epinephrin) and atropin were administered with good effect. There was no mortality in this group.

He concludes that these cases "point out most strikingly the fact that the injection of incompatible blood, namely, in which the donor's cells are agglutinable by the serum of the patient, is attended by the development of symptoms of the gravest nature, and that if these are not early recognized and the transfusion concluded before the injection of a large quantity of blood, fatal results are to be expected."

In the case of citrate transfusions, certain special untoward factors concerned have been made the subject of study in man by Drinker and Brittingham[3] at the Harvard Medical School laboratories. They have failed to observe any constant relation between the method of citration or the purity of the citrate used and the number of reactions. The objectionable component resides in the cells of the blood; for citrated plasma, thoroughly freed from all formed elements by prolonged high speed centrifugalization or by porcelain filtration, is singularly nontoxic, contrasting markedly with serum in this regard. On the other hand, the washed whole cell content of blood is uniformly toxic, whether injected into the individual from which the cells have been removed (plasmapheresis) or into different individuals who have been tested and show no agglutination or hemolysis of red cells.

A further analysis of the location of the factors in the cells responsible for the difficulties indicates that reactions decrease as

the platelets are removed from the transfusion mixture. The Harvard investigators report that salt solution, red cells, white cells in greatly reduced numbers, and absence of platelets make the most perfect blood for transfusion that they have observed. Apparently changes in the platelets as a part of the process of coagulation represent a transformation responsible for the appearance of toxicity. The leukocytes themselves seem to be devoid of incompatibilities. Finally, they seem to have shown that citration harms the red cells, thereby promoting the possibility of hemolysis in otherwise compatible bloods. They found 44 per cent of reactions with citrated blood, as compared with 20 per cent of reactions when uncitrated blood transfusions were performed. They state that 20 per cent is a decidedly lower percentage of reactions than has been obtained with any other method.

Contrasted with their small series, however, is that of Pemberton, who found only 219, or 21 per cent, of reactions in the 1,036 cases which he analyzed. Lewisohn[4] has also recently reported 200 cases, and is convinced that the frequency of chills is about the same with the citrate as with other methods. He, too, found reactions in 20 per cent of his cases.

Thus, one by one, the detrimental factors in transfusion are being recognized. The next steps consist in devising ways to avert or eliminate them and thereby make a frequently desirable performance more dependable and less threatening.—*Jour. A. M. A.*

1. Hektoen, Ludvig: Isoagglutination of Human Corpuscles, J. A. M. A. 48: 1739 (May 25) 1907.
2. Pemberton, J. de J.: Blood Transfusion, Surg., Gynec. & Obst. 28: 262 (March) 1919.
3. Drinker, C. K., and Brittingham, H. H.: The Cause of the Reactions Following Transfusion of Citrated Blood, Arch. Int. Med. 23: 133 (Feb.) 1919.
4. Lewisohn: Am. J. H. Sc. 157: 253, 1919.

ALSACE-LORRAINE.

CONSTANCE WINIFRED STUMPE.

Charlemagne had two sons, Pippin and Lothair, between whom he divided his kingdom. To Pippin fell the land on the west, home of the Franks; to Lothair the valleys of the Meuse, Moselle and the Rhine. The kingdom of Lothair was called Lothringus, or what we today call Lorraine, so it would seem that the claim of France to this disputed bit of territory goes back farther than 1871, farther than Louis XIV, whom the Germans accused of stealing it, back to that king of the Franks who ruled at that point in time when historians say ancient history ends and modern begins—800-814.

Existing along with the greater part of Middle Europe, as part of the Holy Roman empire, and later as a detached state, peopled by Germans, Alsace was annexed to the realm of "the Sun King," Louis XIV, in the middle of the seventeenth century, in return for certain favors done the inhabitants. When the ruling house in Lorraine died out the land reverted to the related House of Bourbon, then on the French throne. What more natural and legitimate acquisition than this?

On June 9, 1871, by virtue of the Treaty of Frankfort, Alsace-Lorraine passed into the hands of the German Emperor, a territory of 5,600 square miles, with nearly 2,000,000 inhabitants. And what of the conquered territories? They must be Germanized. They must speak German, look German, think German. Thousands of workers were deported into Germany to learn German ways and German methods. German was taught in the schools. The French language was forbidden. In spite of their efforts we see how well they succeeded in drawing the mailed gauntlet over the silk glove of France! Beneath it all the lilies bloom!

Americans feel a peculiar and special sentiment in the return of the lost colonies. On a rolling hill that looks down into the flowering valleys of the Rhine, and over the fields of Lorraine there stands a white monument, erected to the first three American soldiers who gave their lives for France. Below the graven names of this heroic trio rest the arms of Lorraine, with its feathery thistles carved in the eternal marble, abloom

forever in memory of these Americans, in memory of Lorraine, for whom they died.

It is a fair land, drained by the River Moselle, that runs through fertile grape country, and further south, by the Rhine as it comes down from the Swiss Alps. Between lie the extended ranges of the Vosges, the "blue Alsatian mountains," theme of an old waltz song. Its generous fields yield quantities of sugar beets, hops, tobacco, flax, hemp and luscious fruits. The mines of Lorraine produce coal, iron and salt. Rich booty for the conquerors of 1871!

Metz, Colmar, Strassburg and Muhlhausen are the largest cities, each boasting well over 20,000 inhabitants. The last existed as an independent city-republic until 1798, when it voluntarily and unanimously asked to be incorporated in the French Republic! Who shall call it German?

About the city of Strassburg, capital of Alsace, romance and sentiment cling. Its memorial has stood weeping in the Place de la Concorde in Paris for forty years, the shrine of loyal Frenchmen, covered with myrtle wreaths and tokens of the mourning of France. Today that same memorial is abloom with lilies and gay with the dear tricolor, for Strassburg is French once more; Alsace has come back to the waiting arms of Mother France.

The streets of these Alsatian cities are thronged with American soldiers. Little Alsatian girls with huge bows in their hair wear Old Glory and the French tricolor side by side. A letter comes from a soldier in Colmar: "This city, which I have seen so sad, it is difficult to recognize. Its dear little old streets, so narrow that the flags touch each other, forming a colorful arch above our heads, sing of the happiness of Alsace. There are old flags of the time before the other war, old faded flags, and there are rich silk flags, whose colors may not be quite true, perhaps, that have been hastily fashioned by loyal fingers out of dancing frocks and wedding gowns, whose white is old ivory, and whose red is ashes of roses * * *.

"Today I went to the schools, where the Red Cross was distributing chocolate among the children. There has not been such a party for a long time, for chocolate has sold for 5 and 6 marks a cake! Most of the children are poorly clad, wearing paper shoes, but all are wearing the loyal cockade, and there is new happiness in their wan little faces, for they know, although they do not understand, that something wonderful has happened. Fairer days are coming! The lilies will bloom again!" — *The Red Cross Bulletin.*

A PRACTICAL SURVEY.

Miss Agnes D. Randolph, *Secretary, Virginia Anti-Tuberculosis Association.*

The Virginia Anti-Tuberculosis Association commenced its present method of field work through surveys eighteen months ago, after a study of the results of the campaign in Michigan.

Our Association had since its organization in 1908 cooperated closely with the State Board of Health, particularly in its policy of the development of State sanatoria for incipient and local hospitals for advanced cases of tuberculosis. Having very limited funds, we had confined ourselves exclusively to what might be called overhead publicity—lectures, bulletins, pamphlets, newspaper articles, etc. This work had been most excellently done under one of our ablest men, but the net results were not completely satisfactory.

After eight years of effort, Virginia had two State Sanatoria, 169 beds for white patients and 40 beds for colored. The localities had been hard to arouse, only three cities had provided local hospitals. As we counted our gains at the end of eight years we were not particularly exultant, and it was natural that we should seek out a different and more concrete method of approaching the problem.

The Michigan work had proved of great interest and seemed particularly applicable to Virginia. The location of cases in a given locality—John Smith, known of all men, living here, and John Doe living there — presented itself to our minds as living and

irrefutable arguments for some of our sturdy doubting Thomases.

An opportunity for a small experiment in the work was offered us by the suggestion from the State Board of Health that they allow us a certain income from a fund appropriated for tuberculosis education, by the Legislature of 1916, thus combining all available educational funds and completely unifying the tuberculosis campaign. This was made practical by the appointment of a sufficient number of members of the Board of Health on the Executive Committee of our Board. The total fund thus secured was decidedly less than the $50,000 Michigan budget, as ours for all purposes was only about $10,000.

In our first survey we had as very definite objects, to discover the extent and location of the disease in the county and to educate the people in symptoms, cure and prevention. We felt that while we had the theory that for every death there were ten living cases, a certain number of whom could be located by even superficial study, nevertheless we had never demonstrated this as true of a county in Virginia, and it was taught by us as a result of deductions from work conducted elsewhere. We wished definite knowledge of Virginia conditions for ourselves. We were certain, also, that the mass of people were totally ignorant of symptons and prevention, were for the most part not under physicians and were living under conditions which guaranteed the continued spread of the disease. We believed that one of the first steps to be taken to cut the death rate must be general education. Past publicity methods had not accomplished this and we now hoped to carry the knowledge to the people, first in theory by lectures, then in practical demonstration by chest examinations.

While our survey plans were largely concerned with these two aspects, we nevertheless carried constantly before us the hope of leaving permanent constructive work behind, with an organization to secure its maintenance. It was planned to study the financial and industrial conditions of the community; the spirit of the people; their organizations and general development. Conferences were to be held at frequent intervals in an attempt to formulate a plan suited to the locality—a logical step forward to urge upon them as soon as results could be published. We believe then, and now, that if actual conditions could be advertised, the people would be ready for constructive work.

In selecting a territory we had a free hand, since the work was experimental and we were not sought by anyone. We determined to choose a locality in which there would be a chance of building a hospital and where a health organization existed which was willing to cooperate with us. Since there were only a few county health organizations in the State this last requirement was a decided restriction. It was, however, held to, since we not only desired the support of such an office in our first work, but we felt that it was valuable to the general state work that we uphold the hands of these health authorities.

Owing to scarcity of funds, our survey force was limited to the director, a field nurse, and a physician loaned to us for clinic work by the State Board of Health. The Director, with the Health Officer, appeared before the local governing board, explained the details of the plan and asked permission to do the work, stating explicitly that while no expense would be charged to the board then, conditions might be found that would cost them money later on. We offered to bring in a report of findings and to include recommendations for action by the board. As soon as permission was granted, the work began.

The director arranged lecture programs, interviewed officials, held conferences and attended to all publicity. She did not stay in the field, but came and went as the campaign was active or as time was required for further case development. Lists were secured of the officers of all organized groups, including church societies, school leagues, women's clubs, lodges, and farming and economic associations. These were all visited by the director and engagements made for talks before the groups. All factories were listed in

the same way and talks arranged for at the noon hour. These engagements were combined where possible, and several were always made for the same day.

In the first territory no organization resulted, although the development of health activities was marked; in the second territory, a good committee resulted, but the health activities have not grown in proportion. It will probably take years to estimate the amount accomplished.

The nurse went into the field with the director. She was furnished with a complete report of the deaths for a period of at least three years. We set before ourselves the goal of finding five living cases for every death, in the belief that the remaining five cases would fall either in or sufficiently close to the class of early incipients to make it a matter of more time than we proposed to spend. It was our desire to come as close as possible to our goal and to leave local agencies which were prepared to carry on the work. As soon as the nurse entered the field she visited all local doctors, white and colored, secured lists from them of their cases and enlisted their cooperation for clinics. As we had expected the list secured in this fashion was very small. The patients were actually not under the physicians. One interesting discovery from this list, however, was the wide discrepancy between the number given us by the doctors and those filed with the health authorities, the latter having a record of only twelve, while our list numbered fifty. In this same county today approximately 200 cases have been properly reported, while about 300 are under the supervision of our nurses.

Immediately after visits were paid to the physicians, the nurse's regular visits to patient began. Our first field was closely settled and had good transportation and at the end of two months we were visiting approximately 100 cases. Our second field was entirely rural and had no transportation, but two months' work gave approximately 75 cases. These patients were found by visiting families in which deaths from tuberculosis were reported by cooperation from the physicians, and by our own clinics. As soon as the nurse had won a footing in the community and had a small group of cases for regular visiting, the first clinic was held. The nurse in every instance selected the location and hour, based upon her knowledge of the community from a tuberculosis and economic standpoint.

The educational campaign in connection with the clinic was planned with the idea of reaching the entire population — a regular 100 per cent roll call. The newspapers gave space daily, placards were posted and dodgers distributed. Lectures were given daily in the schools and finally, on the Sunday before the clinic, talks were made in every church throughout the selected district. The two points hammered upon were early symptoms and the possibility of cure. It was quite amazing to realize how practical a talk on tuberculosis may be given in the churches if a suitable religious preface is made.

In rural Virginia this lecture work often carried us far from the railroads to remote colored churches in which no woman had ever before spoken. We found the response from the people varied. Some were eagerly responsive, some curious, some dubious and others fearful. Perhaps curiosity about us as strange people, and about our strange doctrine, predominated. All, however, were grist for our mill and in our invitation to clinics we always insisted upon the "safety first" idea and the necessity for care of the healthy human machine in order to prevent our clinic from being branded as "only for consumptives" and thereby limiting its usefulness. We had all types of reaction, from that of the old negro who in church praised God aloud that he had lived to see the day and heard the glad tidings of cure for the disease which had killed his own people, to the seriously ill man who refused even to allow an examination for fear we would find grounds for his own dread. The day following the church lectures, the clinics began. These were held morning and evening in the best available public building, school house, church or meeting hall.

A physician from one of the state sanatoria made the chest examinations, a committee of local physicians cooperating with him. We endeavored to have a colored physician on this committee, but were not always successful. The local physicians made examinations and usually checked their results with our doctor. Between clinic appointments, also, the state man did consultation work with the local men if they so desired. We consider this phase of the work very valuable, since the conferences and consultations constantly increase in number and prove that the local doctors like the opportunity given them for consultation with the state's specialists. It also tends to increase the waiting list at the state sanatoria.

One of our chief regrets is the lack of equipment and time for more thoroughly scientific clinic work. We have been fortunate enough to secure cooperation, which a little offsets this handicap. General hospital care has been arranged for several of our non-tuberculosis clinic cases. Sputum tests and Wasserman's can be readily secured, and further examination of doubtful cases have been given by local doctors, or when advisable by specialists in adjacent cities. All positive cases not under a physician are advised by our own doctor and urged to place themselves under a good physician unless sanatoria care is required. When they already have a physician, our doctor confers with him if possible, and he is immediately consulted by the nurse.

Clinics are held on three or four consecutive days in several different sections of the selected territory. The nurse remains in the community, follows up all cases, arranges for further examinations, for hospital treatment, even for raising funds for sanatoria care, and starts the patient upon "The Cure." She visits contacts and other suspects and within three or four weeks arranges a second clinic. In one or two localities the nurse has opened an office, but for rural districts this is impracticable.

Through the nurse's study of the community we have grown more and more interested in making a serious study of contacts and housing but have not allowed ourselves to become diverted from our main purpose. In every locality we have secured as complete lists of contacts as possible; many early cases have been discovered in this way. We have been in a sense disappointed not to find through our several hundred histories the very bad housing conditions which we feel sure exist. Only in a few instances have we made anything approximating complete investigations, and here our findings were much better than we had imagined. We have always realized this part of the work must be left to the agencies following us.

As the nurse knows her community better she has organized contact clinics at which only families and intimate friends of the tuberculous are examined. These clinics show a high percentage of infection, but our work is too limited as yet for any deductions to be drawn.

We count our results in several ways: In examinations made; in patients placed under supervision, at home or in sanatoria; and in local agencies developed and left in the community. We do not mind our low figures particularly, since the work has been confined to localities where no tuberculosis agencies had been developed and is a clear gain to the state.

During the first fifteen months, twelve sets of clinics were held. No complete record of applicants for examination has been kept, since frequently in the country districts an entire colored congregation has presented itself to the distracted vision of our lone physician. Eighteen hundred would be a low estimate of the number of those who came because of real interest in their own condition or in the campaign. Of these 750 were examined. Percentages of infection mean nothing, of course, for so small a number, particularly since we hold the small "consultation" and "contact" clinics. The only figures in which we take pride are those showing cases under supervision. In our first county, with an average of 75 deaths a year,

we now have 225 cases under supervision of nurses. In a small town with an average of 25 deaths a year, we now have 100 cases under supervision. Approximately 50 cases have entered the state sanatoria as a result of the work, in addition to those sent to the local hospitals where such were available.

The cases sent to the state sanatoria have been of particular interest this year, since the state's colored sanatorium opened in May with a capacity of 40 beds. There has been much discussion of whether or not we would have any patients and it was a great relief to find ourselves with a waiting list in July. This, we feel, was a direct proof of the educational value of the survey work. We have not been so successful with the second 40 beds recently opened at the colored sanatorium, and the physician recently wrote demanding clinics in two of the counties in which we had worked.

We also feel that we have been fortunate in the results of our constructive work. In our first community, a nurse was employed at the end of four months and later the tuberculosis department was absorbed by a well-organized health board, established in connection with a cantonment zone. In our second field a community nurse was employed under a local tuberculosis committee. We have been particularly fortunate in the personality of our nurse, and she now acts as consultant in these counties. War and influenza prevented the employment of a nurse in our third county, and we are still sending the nurse into this field for follow-up work.

It was our intention to use this survey plan for strictly rural districts as education for the governing boards and the people. Recently, however, owing to complications in one of our city associations we have loaned our field nurse to them for a similar piece of work. A factory district has been selected. The work will be more intensive and complete, since several city agencies will cooperate in it, and we hope it may prove the means of stirring up an organized community which has through force of circumstances grown stagnant.

It is almost impossible to give the exact cost of a county survey. Our field nurse is paid a fixed salary and is responsible for her own expenses. We use a Ford car, loaned by the State Board of Health. The Director is not continuously occupied in the territory, and the field expenses vary widely even in different sections of the same county. Advertising and special printing have cost us very little, since we use our regular stock literature. The additional amount of this ordered has been charged in with our other educational expenses on the books.

After eighteen months of the work, our board has determined to increase the scope of the plan. The legislature of 1918 passed a direct tax law to be used for additional hospitals. This will give a sufficient fund to enable the State Board of Health to build at least one district hospital. As soon as the site is determined upon, our field force will begin survey work in adjacent counties. A second force will be placed in another part of the state in anticipation of the building of a second district hospital, in 1920. The Board has determined upon this since it believes that this method of field work is probably the surest we can devise for accomplishing four main objectives:

1. Carrying education to the people in the most economical and practical way.
2. Educating the locality to the extent of the disease in their midst.
3. Creating organizations for constructive work.
4. Securing our ultimate aim, the supervision of all consumptives.—*Bulletin of the National Tuberculosis Association.*

THE USE OF YEAST IN GASTRO-ENTERITIS.

Among the diseases in which yeast was used successfully by Hawk and his coworkers (J. A. M. A., LXIX, Oct. 13, 1917, pp. 1243-1247) is gastrointestinal catarrh. This was rather to be expected since brewers' yeast was early used with success in various diseases of the gastrointestinal tract. The

value of Hawk's article is that he showed that the unavailable brewers' yeast may be replaced by the uniform and readily obtainable compressed yeast.

Among the diseases in which various forms of yeast have been used with success is gastroenteritis of infants. There is every reason to believe that these will react to compressed yeast at least as readily as they did to yeast in other forms. Aside from its freshness, as in the cake supplied by The Fleischmann Company, compressed yeast may be readily gauged as to dose, in itself possesses nutritive properties, and contains vitamins. Autolyzed yeast when given by Hess to babies produced a rise in the weight curve. (Am. J. Dis. Children, Vol. XIII, No. 7, Jan., 1917, pp. 98-109.)

Yeast was used in the treatment of gastroenteritis of adults and infants by Drs. Thiercelin and Chevrey (Rev. de Therap. Med.-Che., 1899, pp. 797-803) with marked beneficial results. They gave a suspension of yeast to children by rectum, two or three times a day after the rectum had been washed out. The children were held by the nurse in such a position that they could not expel the suspension. Food was withheld until the fever fell.

Cures of chronic gastroenteritis were treated the same way. In one case of dysenteric diarrhœa (in an adult) that had resisted other treatment for more than a month, the remedy was used with success within 48 hours after first administration. The adult cases were given yeast by mouth as well as by rectum. (One case in an adult was a case of mucomembranous enteritis, which improved very much under yeast treatment.)

It stands to reason that yeast will exert a greater influence on the gastrointestinal tract when it is given by mouth than when it is given by rectum alone. Yeast also has a beneficial effect on infants with gastroenteritis when it is given by mouth. This is shown to advantage in the results obtained by Sittler in the treatment of infants with gastroenteritis with yeast by mouth. (Munch. Med. Wochenschrift, 1906, No. 36, pp. 1761-1762.) Sittler's plan was to cut out milk from the diet, to substitute weak tea or albumin water and gradually to work up to heavier preparations. The yeast was given in sweetened water. When necessary the bowels and the stomach were irrigated and other medicines were employed. Under yeast treatment the odor of the stools became less objectionable, and the number of stools was diminished. Vomiting soon ceased. In some cases a cure was obtained when yeast alone was used. In other cases yeast had a beneficial effect when calomel, bismuth, or irrigation had not produced satisfactory results. The weakly acid reaction of the stools favors the action of the yeast. In one case only did the diarrhea become worse under yeast treatment. The treatment can be satisfactorily combined with the administration of bismuth or tannalbin.

In a more recent publication Sittler investigating the stools of infants has determined that yeast with lactic acid and lactic acid bacilli favors the growth of the bacillus bifidus (a favorable organism) in the stools. He states that treatment with yeast, lactic acid, and lactic acid bacilli may be combined to advantage with treatment with the astringents.

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Of course it is not always safe to reason from analogy. On the other hand is it not well to preserve the open mind and consider if there may not be merit in combinations of vaccines other than Typhoid-Paratyphoid, even though the immunizing response is less distinct and of shorter duration?

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